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been chosen to keep in touch with the affairs of the institute and to cooperate with the faculties and officers of administration.

At the University of California Dr. John C. Merriam, professor of paleontology and historical geology, has been appointed dean of the faculties, and Dr. A. C. Leuschner, professor of astronomy and director of the Students' Observatory, dean of the Graduate Division.

DR. JOHN M. T. FINNEY, associate professor of surgery in the Johns Hopkins Medical School, has been invited to accept the chair of surgery at Harvard University, his alma mater.

DR. HOMER L. DODGE, formerly assistant professor of physics at the State University of Iowa, is now professor and head of the department of physics at the University of Oklahoma, Norman, Okla. He has also been appointed director of the State Bureau of Standards.

MISS CATHERINE BEEKLEY has been appointed as instructor of zoology at the University of Oregon to temporarily fill the place left by Dr. C. H. Edmondson, who has resigned to take up work in the University of Hawaii.

DR. ROGER C. SMITH, of the United States Bureau of Entomology, has resigned to accept the position of assistant professor of entomology in the Kansas State Agricultural College.

DR. W. H. BROWN, formerly associate professor of botany in the University of the Philippines, has been promoted to the full professorship and chief of the department, Mr. Elmer D. Merrill having resigned to utilize his whole time in the interests of the Bureau of Science.

MR. HAROLD BOYD SIFTON, of the Seed Laboratory of the Department of Agriculture, Ottawa, has resigned to accept a position in the botanical laboratories of the University of Toronto.

DISCUSSION AND CORRESPONDENCE

OFFICIAL FIELD CROP INSPECTION

IN a recent number of *SCIENCE* Professor H. L. Bolley, in an article on this subject, has

pointed out that until we have control of seed grain production we will continue to have mixed varieties and the best ones will continue to be lost through carelessness. Bad weeds and diseases will be spread with the seeds.

He states that "the work of each cereal crop improver and public educator on breeding dies with him," and mentions Wellman, Haynes and Saunders as examples. "Seed improvement must last through the life of many men and for this there must be plans based on established law."

I am glad to state that crop improvement associations are springing up in many states. Michigan and Wisconsin have each had an association for about ten years. During the summer (1919) there was a meeting of crop improvement association men at St. Paul, Minn. The states of Michigan, Wisconsin, Minnesota, North Dakota, South Dakota and Kansas had representatives at the meeting, showing that those states were active. Besides this we know that Ohio, Indiana, Illinois, Iowa, Nebraska and Colorado are thinking strongly of organizing crop improvement associations.

Professor Bolley, it seems, does not believe in "cooperative breeders associations." A state-controlled seed inspection under the direction of the agricultural college such as Professor Bolley advocates, will in most cases be preceded by a cooperative seed growers association. It is possible that the North Dakota work is not done by an association, as the North Dakota representatives at the St. Paul meeting were interested in alfalfa seed only, and the pedigreed seed was all sent to Fargo for recleaning. This can't be done when a state is to be supplied with pedigreed seed.

Wisconsin was the first to organize one of these associations, and now they have state aid. Most of us have not reached the stage where the lawmakers have recognized the value of a supply of pure seed, representing the highest yielding pedigreed varieties. Each of the crop improvement associations is fostered by the agricultural college of its state but can not be

an organic part of any agricultural college because the crop improvement associations are producing and selling associations.

First, before one of these associations can work, some plant breeder must have spent years purifying old varieties, or breeding up new ones. In either case the varieties to be tested must have originated from a single selected plant where thousands are usually selected and tested. The work of variety testing may continue for several years, and usually does, before a superior variety is located. The next stage is to try the new variety in various parts of the state. If it is generally found superior to local varieties it is time for an association to begin.

Thus before a crop improvement association can work, a superior variety must exist. It may have been produced in the same or another state but must have been found superior by local testing.

To distribute a new variety in small quantities without control, always means that farmers lose it by allowing it to be mixed with local varieties. The agricultural college can, with the aid of county agricultural agents, see to it that a new variety is kept pure until it leaves the farm where it is being increased. But if the grower is to continue to produce pedigreed seed and any considerable number of growers are to be interested, the producer must be able to obtain a higher price for this seed than is paid in the open market. He has seen to it that the land was free from other grains and noxious weeds. He has treated his grain for smut. He has cleaned his drill. He has pulled weeds and gone to considerable extra expense. All this trouble must be paid for. It is true that farmers are glad to grow a high-producing grain, that they may produce more bushels. They are also willing to grow a grain of higher quality if they can obtain a better price. But, as a rule, they are not willing to produce seed for other folks without a profit. They are business men not philanthropists.

To find a market for the new seed grain, there has to be a selling agency of some kind. This agency is taking the form of a crop im-

provement association. This is a farmers organization in every state where the movement has gone far enough to be of substantial value to the state. Usually the extension specialist in farm crops is the controlling agent. He is often the secretary of the association but not as an officer of the agricultural college. In Michigan he sees to it that the fields of grain are inspected while in head and before harvest. The farmer whose field passes inspection also submits a recleaned sample of the grain to the secretary. If his grain is acceptable the grower receives the shipping tags of the association. The grower certifies on the shipping tag that the seed conforms to the state seed laws and to the sample submitted to the association for inspection. Also if these points are not found true he agrees to refund the purchase price.

To illustrate how pedigreed grains can be taken care of, let me mention some Michigan experience. A bushel of Rosen Rye was sent to Mr. Carlton Horton at Albion in 1912. We now estimate there were 400,000 acres of Rosen Rye in Michigan in 1919. A peck of Red Rock wheat was sown by Mr. John Odell on a half of his garden patch in 1913. Mr. Odell lives about seven miles south of Allegan in Trowbridge Township. He grew $7\frac{1}{2}$ bushels of Red Rock in 1914 and sowed seven acres. He had this seed for sale in 1915, but could not have interested his neighbors if it had not been for the county agricultural agent, the miller and the banker, nor could this seed have continued to be kept pure and sold for seed had it not been for the Michigan Crop Improvement Association. However, I personally inspected over three hundred acres in 1917 that contained less 1 per cent. of other varieties and almost no weeds. All this came from the peck of Red Rock sent to Mr. Odell four years before. In 1919 there were about 60,000 acres of Red Rock in Michigan. Several others of our breeding products have likewise been taken care of.

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